CLAIMS:

WHAT IS CLAIMED IS:

1. A method for encoding a plurality of bits, comprising:

based on a plurality of bits, selecting one of at least two mutually exclusive subsets of a signal constellation and a point within said selected subset; and

modulating the selected point using a carrier waveform,

wherein the selected subset includes at least two constellation points that are separated from one another by a distance based on a conditional distribution.

2. The method of claim 1 wherein the distance based on a conditional distribution is one of a Kullback-Leibler distance and an expected Kullback-Leibler distance.

3. The method of claim 1, wherein selecting a subset of a signal constellation and a point within said selected subset comprises, based on a plurality $m=k_1+k_2$ of bits, using k_1 of the bits to select said subset and k_2 of the bits to select the point within said subset, wherein m, k_1 and k_2 are non-zero integers.

4. The method of claim 3 wherein using k_1 of the bits to select said subset comprises encoding the k_1 bits into n encoded bits, and selecting one of 2^n mutually exclusive subsets with the n encoded bits, wherein n is greater than k_1

5. The method of claim 4 wherein $k_2=1$ and $n=k_1+1$.

6. The method of claim 5 wherein n is selected from the set consisting of three, four and five, wherein the k_1 bits are encoded using a 2/3 convolutional code when n=3, the k_1 bits are encoded using a 3/4 convolutional code when n=4, and the k_1 bits are encoded using a 4/5 convolutional code when n=5.

7. The method of claim 1 wherein the constellation points define concentric circles, and every point lying within a circle is from a different subset from every other point lying on that circle.

8. The method of claim 7 wherein every point on a circle is from a different subset from every other point lying on that circle and from every other point lying on an adjacent circle.

9. The method of claim 8 wherein n=3 and each subset defines two points.

10. The method of claim 1 further comprising transmitting the carrier, receiving the carrier over a fading channel, and decoding the symbol using a Viterbi algorithm.

11. A transmitter for transmitting a series of input bits comprising:

an encoder having an input for receiving a plurality of input bits;

a mapper having an input coupled to an output of the encoder; and

a computer-readable storage medium coupled to the mapper for storing at least one signal constellation,

wherein the mapper selects a subset of said signal constellation and a point within the selected subset based on the plurality of input bits, said selected subset including at least two constellation points that are separated from one another by a distance based on a conditional distribution.

12. The transmitter of claim 11 wherein the distance based on a conditional distribution is one of a Kullback-Leibler distance and an expected Kullback-Leibler distance.

13. The transmitter of claim 11, wherein the plurality of input bits comprises $m=k_1+k_2$ of bits, of which k_1 of the bits are used to select said subset and k_2 of the bits are used to select the point within said subset, wherein m, k_1 and k_2 are non-zero integers.

14. The transmitter of claim 13 wherein the encoder encodes k_1 of the bits into n encoded bits, and the mapper selects one of 2^n mutually exclusive subsets using the n encoded bits, wherein n is greater than k_1

15. The transmitter of claim 14 wherein $k_2=1$ and $n=k_1+1$.

16. The transmitter of claim 15 wherein n is selected from the set consisting of three, four and five, wherein the k_1 bits are encoded using a 2/3 convolutional code when n=3, the k_1 bits are encoded using a 3/4 convolutional code when n=4, and the k_1 bits are encoded using a 4/5 convolutional code when n=5.

17. The transmitter of claim 11 wherein the constellation points define concentric circles, and every point lying within a circle is from a different subset from every other point lying on that circle.

18. The transmitter of claim 17 wherein every point on a circle is from a different subset from every other point lying on that circle and from every other point lying on an adjacent circle.

19. The transmitter of claim 18 wherein n=3 and each subset defines two points.

20. The transmitter of claim 12 further comprising a receiver, said receiver said receiver using a Viterbi algorithm to decode a received symbol into a subset and a point within the subset according to the constellation.

21. A method for encoding a plurality of $m=k_1+k_2$ input bits comprising:

selecting a subset of a signal constellation based on the k_1 input bits;

selecting a point within the selected subset based on the k_2 input bits, wherein at least two points within the selected subset are spaced from one another by a distance based on a conditional distribution of at least one of said at least two points; and

modulating the selected point using a carrier waveform,

wherein m, k_1 and k_2 are non-zero integers, and at least one of k_1 and k_2 are greater than one.

22. The method of claim 21, wherein selecting a subset of a signal constellation based on the k_1 input bits comprises encoding the k_1 input bits into n encoded bits and selecting one of 2^n subsets using the n encoded bits, wherein n is an integer greater

than k_1 that is derived from the k_1 bits and a previously input plurality of bits.

23. The method of claim 22, wherein each subset consists of two points and the signal constellation consists of 2^{m+1} points.